

We Claim:

1. A method of injection molding a plastic product having a base wall and a
sidewall, the method comprising the steps of:

(a) injecting fluid plastic material into a base-wall section of a mold cavity; and

(b) conducting said injected plastic material through at least one flow guide in the
base-wall section and thence into a sidewall section of the mold cavity;

wherein step (b) comprises the step of:

(c) conducting said injected plastic material through a sequence of variable-
opening throttles in said at-least-one base-wall-section flow guide, wherein the openings
of said throttles can vary in response to variations in the thickness of a region of the
sidewall section into which injected plastic material is conducted from said at-least-one
base-wall-section flow guide so that upon an increase in the thickness of said region the
openings of said throttles in said at-least-one base-wall-section flow guide decrease and
so that upon a decrease in the thickness of said region the openings of said throttles in the
said at-least-one base-wall-section flow guide increase.

2. A method according to Claim 1, further comprising the step of:

(d) within the sidewall section of the mold cavity, directing the flow of some of
the injected plastic material by means of at least one sidewall-section flow guide.

3. A method according to Claim 1, further comprising the step of:

(d) within the sidewall section of the mold cavity, directing the flow of some of the injected plastic material by means of a sidewall-section flow guide that extends from said at-least-one base-wall-section flow guide.

4. A method according to Claim 1, wherein step (b) comprises conducting said injected plastic material through a plurality of said throttled base-section flow guides and thence into the sidewall section of the mold cavity.

5. A method according to Claim 4, wherein the method further comprises the step of:

(d) directing the injected fluid plastic material into thin-wall cavity sectors of the base-wall section to chambers adjacent the sidewall-section periphery of the base-wall section at a juncture of the plastic material directed into thin-wall cavity sectors of the base-wall section by the flow guides adjacent the thin-wall cavity sectors to thereby form ridges on the inside of the base wall of the injection-molded product.

6. A method according to Claim 4, further comprising the step of:

(d) within the sidewall section of the mold cavity, directing the flow of some of the injected plastic material by means of sidewall-section flow guides that extend respectively from a plurality of said throttled base-wall-section flow guides.

7. A method according to Claim 4, further comprising the step of:

(d) shaping the mold cavity by combining a first mold part and a second mold part in an aligned opposition to one another;

wherein the throttles are shaped by partially opposed recesses in the combined first and second mold parts, with the opposed recesses being so staggered in the respective direction of conduction within the individual base-wall-section flow guides that whenever the alignment between the combined first and second mold parts varies along the direction of conduction for a given flow guide the openings of the throttles in the given flow guide vary.

8. A method according to Claim 1, further comprising the step of:

(d) shaping the mold cavity by combining a first mold part and a second mold part in an aligned opposition to one another;

wherein the throttles are shaped by partially opposed recesses in the combined first and second mold parts, with the opposed recesses being so staggered along the direction of conduction within the at-least-one base-wall-section flow guide that whenever the alignment between the combined first and second mold parts varies in said direction the openings of the throttles vary.

2 9. A method according to Claim 1, wherein the base-wall section includes a
plurality of said throttled flow guides that extend radially for conducting said injected
4 plastic material through the base-wall section and thence into the sidewall section of the
mold cavity; further comprising the step of:

6 (d) conducting the injected plastic material within the base-wall section by means
of a plurality of concentric flow guides that intersect the radially extending flow guides.

10. A method according to Claim 1, further comprising the step of:

2 (d) adjusting said conduction within the at-least-one base-wall-section flow guide
4 by protracting a movable mold part into said flow guide or by retracting a movable mold
part from said flow guide.

2 11. A method according to Claim 1, wherein the mold parts include an adjustable
cavity mold part and a core mold part for shaping at least a portion of the base-wall
4 section of the mold cavity when the adjustable cavity mold part and the core mold part
are combined in an aligned opposition to one another;

the method further comprising the step of:

6 (d) initializing the position of the adjustable cavity mold part to adjust the
alignment between the adjustable cavity mold part and the core mold part.

12. A method according to Claim 11, further comprising the step of:

2 (e) dynamically varying the position of the adjustable cavity mold part to further
adjust the alignment between the adjustable cavity mold part and the core mold part.

13. A method according to Claim 1, wherein the mold parts include an adjustable
cavity mold part and a core mold part for shaping at least a portion of the base-wall
section of the mold cavity when the adjustable cavity mold part and the core mold part
are combined in an aligned opposition to one another;

the method further comprising the step of:

(d) dynamically varying the position of the adjustable cavity mold part to adjust
the alignment between the adjustable cavity mold part and the core mold part.

14. A method according to Claim 1, further comprising the step of:

(d) shaping the mold cavity by combining opposed first and second mold parts in
a direction of mold closure; and

wherein the shortest distance within the mold cavity in said direction of mold
closure is larger than the elastic compression distance of the mold cavity when the mold
is compressed by a requisite clamping force.

15. A mold for injection molding a plastic product having a base wall and a
sidewall, comprising:

mold parts for shaping a mold cavity for forming the product and a gate from
which fluid plastic material can be injected into a base-wall section of the mold cavity;

wherein the base-wall section includes at least one flow guide for conducting said
injected plastic material through the base-wall section and thence into a sidewall section
of the mold cavity; and

wherein the at-least-one base-wall-section flow guide includes a sequence of
variable-opening throttles through which said injected plastic material is so conducted,
wherein the openings of said throttles can vary in response to variations in the thickness
of a region of the sidewall section into which injected plastic material is conducted from
said at-least-one base-wall-section flow guide so that upon an increase in the thickness of
said region the openings of said throttles in said at-least-one base-wall-section flow guide
decrease and so that upon a decrease in the thickness of said region the openings of said
throttles in the said at-least-one base-wall-section flow guide increase.

16. A mold according to Claim 15, wherein the sidewall section of the mold
cavity includes at least one flow guide for directing the flow of some of the injected
plastic material.

17. A mold according to Claim 15, wherein said at-least-one sidewall-section
flow guide extends from said at-least-one base-wall-section flow guide.

18. A mold according to Claim 15, wherein the base-wall section includes a plurality of said throttled flow guides for conducting said injected plastic material through the base-wall section and thence into the sidewall section of the mold cavity.

19. A mold according to Claim 18, wherein the sidewall section includes a plurality of flow guides respectively extending from a plurality of said throttled base-wall-section flow guides for directing the flow of some of the injected plastic material within the sidewall-section.

20. A mold according to Claim 18, wherein the mold cavity further includes chambers adjacent the sidewall-section periphery of the base-wall section at a juncture of the plastic material directed into thin-wall cavity sectors of the base-wall section by flow guides adjacent the thin-wall cavity sectors for forming ridges on the inside of the base wall of the injection-molded product.

21. A mold according to Claim 18, wherein the mold parts include a first mold part and a second mold part for shaping the mold cavity when the first and second mold parts are combined in an aligned opposition to one another; and

wherein the throttles are shaped by partially opposed recesses in the combined first and second mold parts, with the opposed recesses being so staggered in the respective direction of conduction within the individual base-wall-section flow guides that whenever the alignment between the combined first and second mold parts varies along the direction of conduction for a given flow guide the openings of the throttles in

the given flow guide vary.

22. A mold according to Claim 15, wherein the mold parts include a first mold
part and a second mold part for shaping the mold cavity when the first and second mold
parts are combined in an aligned opposition to one another; and

wherein the throttles are shaped by partially opposed recesses in the combined
first and second mold parts, with the opposed recesses being so staggered along the
direction of conduction within the at-least-one base-wall-section flow guide that
whenever the alignment between the combined first and second mold parts varies in said
direction the openings of the throttles vary.

23. A mold according to Claim 15, wherein the base-wall section includes a
plurality of said throttled flow guides that extend radially for conducting said injected
plastic material through the base-wall section and thence into the sidewall section of the
mold cavity and a plurality of concentric flow guides that intersect the radially extending
flow guides.

24. A mold according to Claim 15, wherein the mold parts include a movable
mold part that is disposed for protraction into and retraction from the at-least-one base-
wall-section flow guide for adjusting said conduction within said flow guide.

25. A mold according to Claim 15, wherein the mold parts include an adjustable
cavity mold part and a core mold part for shaping at least a portion of the base-wall
section of the mold cavity when the adjustable cavity mold part and the core mold part
are combined in an aligned opposition to one another;

the mold further comprising:

means for initializing the position of the adjustable cavity mold part to adjust the
alignment between the adjustable cavity mold part and the core mold part.

26. A mold according to Claim 25, further comprising:

means for dynamically varying the position of the adjustable cavity mold part to
adjust the alignment between the adjustable cavity mold part and the core mold part.

27. A mold according to Claim 15, wherein the mold parts include an adjustable
cavity mold part and a core mold part for shaping at least a portion of the base-wall
section of the mold cavity when the adjustable cavity mold part and the core mold part
are combined in an aligned opposition to one another;

the mold further comprising:

means for dynamically varying the position of the adjustable cavity mold part to
adjust the alignment between the adjustable cavity mold part and the core mold part.

28. A mold according to Claim 15, wherein the mold cavity is shaped by
combining opposed first and second mold parts in a direction of mold closure; and

wherein the shortest distance within the mold cavity in said direction of mold

4 closure is larger than the elastic compression distance of the mold cavity when the mold
is compressed by a requisite clamping force.

29. A method of injection molding a plastic product, the method comprising the
steps of:

(a) injecting fluid plastic material into a mold cavity;

(b) conducting said injected plastic material through at least one flow guide in the
mold cavity; and

(c) adjusting said conduction within the at-least-one flow guide by protracting a
movable mold part into said flow guide or by retracting a movable mold part from said
flow guide.

30. A method according to Claim 29, wherein the at-least-one flow guide
includes a first segment and a second segment that is misaligned with the first segment
but that overlaps the first segment to enable conduction of fluid plastic material from the
first segment to the second segment;

wherein the movable mold part is disposed at said overlap; and

wherein step (c) includes protracting the movable mold part to decrease said
overlap or retracting the movable mold part to increase said overlap.

31. A mold for injection molding a plastic product, comprising:

mold parts for shaping a mold cavity for forming the product and a gate from which fluid plastic material can be injected into the mold cavity;

wherein the mold cavity includes at least one flow guide for conducting said injected plastic material within the mold cavity; and

wherein the mold parts include a movable mold part that is disposed for protraction into and retraction from the at-least-one flow guide for adjusting said conduction within said flow guide.

32. A mold according to Claim 31, wherein the at-least-one flow guide includes a first segment and a second segment that is misaligned with the first segment but that overlaps the first segment to enable conduction of fluid plastic material from the first segment to the second segment; and

wherein the movable mold part is disposed at said overlap to decrease said overlap when the movable mold part is protracted and to increase said overlap when the movable mold part is retracted.